



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,775	12/19/2001	Peter J. Janssen	US010551	3937
24737	7590	12/30/2004	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			CURTIS, CRAIG	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,775

Applicant(s)

JANSSEN, PETER J.

Examiner

Craig Curtis

Art Unit

2872

PC

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/5/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Disposition of the Instant Application

- This Office Action is responsive to Applicant's Request for Continued Examination filed on 5 October 2004, which has been made of record in the file.
- Claims 1-11 are currently pending in the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-4 & 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (US 6,587,269 B2).**

With regard to claim 1, Li discloses the invention as claimed—[a] method the of converting an input beam of non-polarized light having a waist of predetermined height and width in a predetermined plane to an output beam of polarized light having a geometrical extent increased from that of said input beam by no more than a factor of two [see Fig. 6], said method [the structural element teachings of Li implicitly encompassing the method teachings recited in the instant invention] comprising:

a) positioning a polarizing beam splitter [PBS 30] with an input surface having a height and width equal to a predetermined height and width in a predetermined plane, thereby dividing said input beam into perpendicular P and S polarized components [column 3, lines 4-10];

b) passing said P [PBS 30 can be coated to transmit P or S and reflect S or P] component light beam through a 1/2 wave retarder [40 in Fig. 6], whereby the light beam exiting said 1/2 wave retarder has the same polarization as said S component light beam [see Fig. 6; again, the choice of polarization state, S or P, being a simple matter of design choice];

c) said 1/2 wave retarder being spaced from contact with said polarizing beam splitter [see gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8];

d) positioning a turning prism (see 60 in Fig. 6, turning prisms being optically equivalent to mirrors disposed at 45^0) in the path of said S component light beam to direct said S component light beam passed therethrough parallel to and laterally adjacent said P component light beam exiting said 1/2 wave retarder, said P and S component light beams exiting said 1/2 wave retarder and said prism jointly forming an output beam having a geometrical extent exceeding that of said input beam by a factor of substantially two [see output waveguide 50 in Fig. 6; also see column 3, lines 14-17];

e) said turning prism being spaced from contact with said polarizing beam splitter [see gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8];

f) totally internally reflecting said P component in said polarizing beam splitter and said S component in said turning prism [see above and column 5, lines 35, 43, 44, 49-55, 60, and 61].

With regard to claim 2, Li further discloses wherein said TIR is achieved by providing a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism,

and a second air gap between parallel, opposing surfaces of said polarizing beam splitter and said 1/2 wave retarder. See gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8.

With regard to claim 3, Li further discloses wherein said TIR is achieved by providing a first layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said prism, and a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said 1/2 wave retarder. See gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8;

With regard to claim 4, Li further discloses wherein said output beam is directed as polarized input light to a liquid crystal based projector. See 150 (an LCD imager at column 1, lines 24-25 and column 6, lines 35-36.

With regard to claim 6, Li further discloses wherein said turning prism includes parallel side surfaces and said S component light beam is confined in said turning prism by TIR by said side surfaces. See, e.g., Fig. 6; also see column 5, lines 30-36.

With regard to claim 7, Li further discloses a non-imaging polarization conversion method comprising: a) generating a beam of collimated light having a waist of predetermined height and width in a predetermined plane [input waveguide 20 of rectangular cross-section to correspond with the shape of the imager and the final projected image at column 4, lines 27-30]; b) positioning a planer, rectangular input surface of a polarizing beam splitter in said predetermined plane, said surface having a height and width equal to a predetermined height and width, a first portion of said input beam passing through said polarizing beam splitter as a P component light beam and a second portion of said beam being reflected by said polarizing beam

Art Unit: 2872

splitter as an S component light beam [PBS 30 in Fig. 6; column 3, lines 4-10, column 4, lines 63-67, continuing at column 5, lines 1-4; c) positioning a turning prism in the path of said S component light beam to redirect said S component light beam in a path parallel to and laterally adjacent said P component light beam [mirror 60 in Fig. 6; also column 5, lines 30-34]; d) said turning prism being spaced from contact with said polarizing beam splitter [see gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8];

e) totally internally reflecting said P component in said polarizing beam splitter and said S component in said turning prism [see above and column 5, lines 35, 43, 44, 49-55, 60, and 61].

With regard to claim 8, Li further discloses passing said S component light beam through a $1/2$ wave retarder, thereby placing said S component light beam in phase with said P component light beam. See $1/2$ wave plate 40 in Fig. 6; also see column 3, lines 9-11 and lines 56-67—column 4, lines 1-3.

With regard to claim 9, Li further discloses wherein said TIR is achieved by providing a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism, and a second air gap between parallel, opposing surfaces of said polarizing beam splitter and said $1/2$ wave retarder. See gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8.

With regard to claim 10, Li further discloses wherein said TIR is achieved by providing a first layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said prism, and a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said $1/2$ wave retarder. See gaps 70 in Fig. 6; also see column 5, lines 38-40, 52-55, 66, 67—column 6, lines 1-8.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 6,587,269 B2).

Li discloses the claimed invention as set forth above **EXCEPT FOR** an explicit teaching wherein said waist is elliptical. The beams in actual physical systems (or the methods associated with same) are rarely, if ever, absolutely circular in cross-section. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have provided said method with a beam having an elliptical beam waist--such being, to some degree, virtually inevitable—for at least the purpose of achieving, for the sake of example, a desired intensity profile in the resulting illumination footprint of the output light beam.


Contact Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig H. Curtis, whose telephone number is (571) 272-2311. The examiner can normally be reached on Monday-Friday, 9:00 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn, can be reached at (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. H. C.
Craig H. Curtis
Group Art Unit 2872
22 December 2004


Audrey Chang
Primary Examiner
Technology Center 2800